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ture occasioned by expansion on escaping from the compression used to force the air in a rapid current through the apparatus. Apjohn's dew-point observations are then compared, and the errors are found to be similar to the preceding, and apparently from the same cause.

To make the formula generally useful, the author gives a table of the depression of dew-point below temperature for every degree of depression of the moist bulb, at every 5° of temperature from 0° to 100°, and for every 10° from 100° to 140°, which he protracts on a chart, so as to give the dew-point in every case with little more trouble than is required for reading a common thermometer, and also at the same time the elasticity of vapour in the atmosphere.

"Experiments on the influence of Magnetism on Polarized Light." By Professor Carlo Matteucci. Communicated by Sir John F. W. Herschel, Bart., V.P.R.S. &c.

The object of this notice is to communicate some recent experiments on diamagnetism, and particularly on the influence of magnetism on polarized light. The following extracts are in the words of the author:—

"The apparatus I employed in these experiments was an electro-magnetic apparatus invented by M. Rumkorf, and described by M. Biot at a meeting of the Academy of Sciences of Paris, and consisting of a powerful electro-magnet, of which the soft iron cylinder is traversed by a hole in the direction of the length of the axis, through which hole the ray of polarized light is made to pass; and the voltaic current which I employed on this occasion was that of seven pair of Grove's construction. I made my first experiment with a piece of *heavy glass*, which I received from Faraday himself. In order to assure myself of the exact amount of rotation induced by magnetic action, I caused the ray of light, before it reached the heavy glass, to pass through the system invented by M. Soleil, consisting of two equal plates of perpendicular quartz, placed side by side; the one turning to the right, the other to the left. I ascertained, first of all, the rotation produced by making the current pass sometimes in one direction, and sometimes in the other; the two rotations, one to the right, the other to the left, thus produced, were exactly the same. Then I compressed slightly the middle part of the piece of heavy glass, in the same manner as one compresses pieces of glass. I was then obliged to turn the eyepiece in a certain direction in order to restore the image to its first condition; in my experiments I always had to turn it, after compression, towards the right. I next made the current pass, first in one direction, then in the other. The general facts which I have observed constantly and without exception are the following:—*The rotation produced by the magnet on the compressed piece of heavy glass is not the same to the right as it is to the left: the rotation produced by the magnet is considerably greater in the direction of the rotation produced by compression than it is in the contrary direction: the rotation produced by the magnet on the compressed heavy glass, and in the direction of the rotation produced by the compression, is greater than that produced by the same magnet on glass*

which has not been compressed, and the rotation in the contrary direction is less. The following are the numerical results.

"In one experiment I obtained on a piece of heavy glass not compressed, 3° of rotation to the right or to the left, according to the direction of the current: on slightly compressing the glass, I had to turn to the right the eyepiece to 4°, 5°, and even to 8° in order to restore the image to its first condition. In closing the circuit, the rotation produced in the same direction as that due to compression was $3\frac{1}{2}^\circ$ or 4°, while the rotation produced in the contrary direction was from 2° to $1\frac{1}{2}^\circ$. On ceasing to compress the glass, I obtained the same phænomena as I had observed before the compression.

"I have made in the same manner experiments with a piece of flint-glass, which produced a rotation of 2° under the influence of the magnet. When I applied the same magnet to pieces of compressed flint-glass, I could not discover the slightest sensible rotation in whatever direction I might make the current pass. Plates of quartz cut perpendicularly or parallel to the axis, and compressed in various directions, did not acquire any rotatory power under the influence of the magnet. I think that the peculiarity exhibited by compressed heavy glass is of some interest, in as far as it appears likely to lead to a more satisfactory explanation of the want of rotatory power communicated by magnetism in crystalline bodies.

"I shall conclude by communicating the negative results of some experiments I attempted with a view to discover the action of diamagnetic bodies on each other, and of magnetism on gaseous bodies. I suspended small needles of bismuth between the poles of a very powerful electro-magnet, and with a good chronometer I counted the number of their oscillations, either alone or in the vicinity of pieces of bismuth of various shapes and sizes. I repeated these experiments with all possible care, avoiding the slightest current of air, reckoning the smallest oscillations, and those of the same extent in the different cases. I never obtained any differences beyond half a second, which existed equally whether the pieces of bismuth were near or not. The experiment therefore does not serve to show the action of diamagnetic bodies on each other; an action which naturally ought to exist, but which perhaps is overpowered by the stronger action of the magnet.

"I afterwards counted the oscillations of a small needle of bismuth, which I succeeded in suspending by a silk fibre (*fil de cocon*) inside of a glass ball blown at the top of a barometer-tube. The ball was placed between the poles of my electro-magnet. In this experiment the bismuth needle was held sometimes in a nearly perfect vacuum, at others in atmospheric air. The number of oscillations in both cases was exactly the same.

"We must therefore give up the idea of explaining diamagnetic phænomena by a magnetic action, which would be stronger upon the air than upon bismuth."